

JUNGLE WARFARE

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TABLE OF CONTENTS

CHAPTER I

GENERAL CONSIDERATIONS

	Paragraph	Page
Definition	1	1
Movement	2	1
Special Features	3	1
Training	4	2

CHAPTER II

INDIVIDUAL CONSIDERATIONS

Food	5	3
Sleeping	6	3
Clothing	7	4
Medical Care	8	4
Bathing	9	5
Snakes	10	5
Crocodiles	11	5
Wasps and Bees	12	5
Poisonous Insects	13	5
Leeches	14	6
Care of Small Arms	15	6
Expedients	16	6

CHAPTER III

JUNGLE DISEASES

SECTION 1

General	17	9
---------------	----	---

SECTION 2

DISEASES

Insect and Animal Borne Diseases	18	10
Water-Borne Diseases	19	11
Fungus Diseases	20	11
Snake Poisoning	21	11

CHAPTER IV

THE ARMS

	Paragraph	Page
Infantry	22	13
Field Artillery	23	14
Mechanized Units	24	15
Engineer and Pioneer Troops	25	15
Aviation	26	15
Parachute Troops	27	16

CHAPTER V

SECURITY

General	28	17
Counter-Reconnaissance	29	17
Maintenance of the Initiative	30	17
Antiaircraft Security	31	18
Antimechanized Security	32	18

CHAPTER VI

MARCHES AND BIVOUAC

SECTION 1

MARCHES

General	33	19
March Instruction	34	19
Meeting an Ambush	35	20
Trail Cutting	36	20

SECTION 2

BIVOUAC

Requirements	37	22
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CHAPTER VII
ATTACK AND DEFENSE

SECTION 1

ATTACK

	Paragraph	Page
Forms of Attack	38	25
Formation	39	25
Reserves	40	26

SECTION 2

DEFENSE

General	41	27
Discussion	42	27
Preparation	43	28

CHAPTER VIII
SPECIAL OPERATIONS

Patrols	44	31
Night Attacks	45	32
Ambushes	46	32
Attack and Defense of River Lines	47	33

CHAPTER IX
SIGNAL COMMUNICATION

General	48	35
Appendix I		37

CHAPTER I

GENERAL CONSIDERATIONS

1. **Definition.**—Jungle warfare will include all operations in a region characterized by a high annual rate of rainfall resulting in heavy growths of vegetation which hinder vision, movement, and fire. Jungle country may vary from the vast forests of Malaya, Burma and the highlands of Africa to the scrub-covered low hills of East Africa, India and the Middle East. The features common to these areas are: scarcity of roads and railways; limited visibility for both ground and air forces; and difficulties presented to cross country movement of all troops and vehicles. Much of the typical jungle country is broken by grassy open plains or sabanas where the vegetation is sparse and visibility good. These plains usually exist on ridges or upward toward the crest of mountains. The slopes of grassy sabanas are often steep and become very slippery when wet, making them difficult to ascend, particularly with heavy weapons.

2. **Movement.**—The jungle, although not impenetrable, is difficult to traverse. Movement through it is generally limited to narrow trails which either already exist or which must be cut by troops for the specific purpose. Old trails are usually in poor condition and so winding as to make following a compass direction while moving on them extremely difficult. Large swampy areas and streams are often numerous; bridges are usually either non-existent or very poor. The high annual rate of rainfall will make most trails virtually impassable to motor vehicles and armored mechanized units much of the time.

3. **Special Features.**—A distinctive type of combat is necessary to surmount the difficulties presented by nature in jungle warfare. The special features of the jungle must be exploited to advantage by the use of tactics suited to the particular conditions. Because of low visibility, poor means of communications and the difficulties of movement and control, jungle warfare is conducive to the efforts of small semi-independent, self-sustaining units, able to operate efficiently on their own initiative under their own commanders. Commanders must, therefore, develop initiative and quick tactical perception. They must appreciate the vital necessity of personal control. The normal system of control through staff and signal communication facilities is often too slow to meet the rapidly moving tactical situation; therefore, all staffs must be highly trained and facilities for signal communication be of such a nature as to permit a maximum of control by commanders under the most adverse conditions.

a. When contact is imminent, commanders must be well forward, ready at all times to evaluate the type of resistance

encountered and to seize the tactical initiative. The success of any jungle operation will depend primarily upon the initiative and training of individuals and small units. More than any other type of combat, jungle fighting is a contest of individuals. When the fight has begun its outcome will be the result largely of the degree of training received by the command to fit them for jungle combat. Instruction must be such that subordinate commanders and men are made to understand the conditions which may confront them when they approach and close with the enemy in the jungle. Failure to prepare troops thoroughly for actual conditions which will be encountered in this type of combat will result in their being surprised both mentally and physically. A standard of training must be attained which will enable us to defeat the enemy under the most adverse condition; that is, when he has superiority on ground, sea and in the air. The difference between trained and untrained troops in jungle warfare is so marked that, even under such conditions, it will be possible to wrest the tactical initiative from the enemy provided we are prepared for the particular conditions imposed by the jungle and not surprised by them.

4. **Training.**—A training program for troops who will take part in jungle combat should include components designed to develop the prime requisites of initiative, resourcefulness, control of small groups in the jungle, stalking, instantaneous reaction in ambush, and aggressive action at all times. Special emphasis must be placed on night training in offensive and defensive maneuvers as well as scouting and patrolling. A maximum of the training time should be spent under field conditions in the application of tactical principles necessary to success in jungle combat for it is of the utmost importance that troops be conditioned to withstand the extreme rigors which jungle warfare imposes both physically and mentally.

a. All phases of training should be positive and direct, with the ultimate purpose of developing teamwork and individual initiative in all units. Collective and individual mobility, initiative, resourcefulness, self-sufficiency, the power to endure and the desire to close with the enemy and kill should be the attributes of all commands.

CHAPTER II

INDIVIDUAL CONSIDERATIONS

5. **Food.**—Jungle service will require that most foods be ready to eat without cooking, and all food carried give the maximum food value for the minimum weight. Dried foods which are easily carried and have a high nutritive content are desirable in such operations, because they are less likely to spoil in a humid climate and are easily carried. Two pounds per day of such dried foods as rice, dried beans, dried cooked meats, dried fruits and vegetables, powdered milk, and coffee essence give ample nutrition, vitamins, roughage, and volume for prolonged hard marching. The C, K, and D Rations have been found very satisfactory for operations in jungle country, although it is not advisable to use the "D" ration in situations where water is not plentiful because of the thirst this ration will create.

a. It is essential that all men engaged in jungle operations have at least a rudimentary knowledge of cooking. Utensils for this purpose need include only a light vessel for boiling, such as the aluminum canteen cup, and a spoon. Most foods obtainable in the jungle can be cooked over an open fire.

b. Clean food is essential. A lifelong disease such as amoebic dysentery may be contracted from eating even the smallest amount of unclean or contaminated food. Flies must be kept away from all foodstuffs; leftovers should not be eaten—food will spoil in a few hours in a tropical climate. Wash and disinfect all eating vessels and utensils before and after eating. A little chlorine or iodine solution will kill germs. Whenever possible mess gear should be sun dried. Native houses are one of the worst sources of disease and must be avoided. Individuals should be cognizant of those edible foods (berries, roots, fruits, etc.) which grow wild and are indigenous to that area in which he is operating. Bananas, papaya, taro, cabbage palm, pineapples, coconuts, and citrus fruits will be found in practically every jungle country. Some of the eatable kinds of meat found in the tropics are, wild chicken, duck, pigeon, cattle, pigs, flying fox, fish, and fresh water crawfish.

6. **Sleeping.**—Jungle conditions will require that all men take special steps to insure adequate rest. The ground in the jungle will often be too wet to permit the individual to sleep comfortably without making some arrangements beforehand. No man should sleep on the wet ground unless it is impossible to do otherwise. To do so may seriously impair his combat efficiency by depriving him of adequate rest, as well as making him more susceptible to disease.

a. Branches laid together to form protection from the wet ground may be used to advantage. When time and the situation permit, a crude bed may be constructed by driving four forked sticks into the ground to support a frame of two inch poles. Across this frame thinner poles are lashed and covered with light branches. The shelter tent and mosquito net may then be pitched over this, or the mosquito netting alone in dry weather. Hammocks may be improvised from a shelter half or blankets hung between trees. It is important that the mosquito net be used at night, for it is at this time that many disease carrying insects are most active. The upper part of the body should be warmly covered at night as the tropical nights are often cool. A sleeveless sweater or flannel shirt should be worn while sleeping.

7. **Clothing.**—In general, clothing items of cotton and canvas are most suited to conditions met in jungle combat. Clothing should be loose fitting, porous and highly resistant to saw grass, thorns, brambles and insect pests. The light-weight poncho, which serves a number of purposes, will be more satisfactory than a raincoat. The helmet liner M1 has been found more satisfactory than either the fiber tropical helmet or the fatigue hat for jungle wear. A head net and gloves which are mosquito proof are inseparable parts of each individual's equipment. Shoes should be new when beginning jungle operations, and kept oiled to prevent wet rot. Lightweight canvas and rubber shoes have been found useful for scouting.

8. **Medical Care.**—The individual will provide much of his own medical care in jungle operations, therefore a knowledge of first aid and the rules of personal hygiene is essential. In addition to his issue First Aid Pack each man should carry, easily available, a small bottle of iodine, adhesive tape, insect repellent, salt tablets, and sulfa drugs in form of pills and powder. These as well as atabrine or quinine should be available in every platoon headquarters, since jungle combat will often call for the independent operations of small units. The nature of jungle combat is such that small cuts and scratches may result in serious infection. Each man must be careful to keep such wounds clean and protect them from jungle filth through his own initiative. The excessive sweating which results from heavy muscular exercise in the jungle will produce a deficiency of fluid and salt (sodium chloride) in the body. Thirst is created, and further intake of water will merely result in additional loss of salt. To offset this all men must increase their salt consumption during periods of heavy muscular exertion, by using more salt on their food, drinking salt water, and taking salt tablets. Usually 10 to 15 grains of salt per day will be sufficient to maintain the salt balance of the body during these periods. A criteria would be 10 grains of salt for each canteen of water drunk.

9. Bathing.—One of the important functions of the skin is to regulate the body temperature through perspiring, therefore it is important that all men exercise scrupulous personal cleanliness while engaged in jungle operations in order to permit the bodily cooling system to equalize the effects of the heat. The skin also excretes waste through the pores and frequent bathing will be necessary to keep these pores free from oil and accumulated dirt and germs. The skin is the individuals best weapon against disease and infection. It actively works to prevent the ingress of germs into the blood stream. It is, therefore, important that the best possible care be taken of the skin by frequent bathing in warm or hot water with a mild germicidal soap. Caution should be exercised that no water gets into the mouth. Sponges are breeding grounds for germs and should never be used. Do not bathe in jungle streams unless the water is approved by a medical officer.

10. Snakes.—Although snakes of many varieties inhabit most jungle countries, the snakes in the tropics are less dangerous than those found in New Mexico or Florida, insofar as the chances of being bitten is concerned. Many tropical islands are completely free from snakes. Snakes will seldom bite a man unless molested. All ordinary precautions should be taken to avoid snakes and areas likely to be infested with them. Particular care should be taken to avoid snakes when clearing ground for a bivouac area, trails and fields of fire.

11. Crocodiles.—Crocodiles infest many tropical regions. These reptiles will seldom attack a man, however caution should be exercised when swimming in rivers and jungle lakes, that no crocodiles are present. When approaching or attempting to kill a crocodile care must be taken to avoid the powerful sweep of its heavy tail with which it can easily break a man's leg. The crocodile can move rapidly across country, but is unable to change direction readily, therefore if pursued by a crocodile it is best to change direction often.

12. Wasps and Bees.—Wasps and bees are abundant in many jungle areas, but need not be feared since they will not ordinarily attack unless their nests are disturbed. In some localities a small bee known as the "sweat bee" will be found which collects on exposed parts of the body in large numbers during the dry season, especially if the individual is sweating. These bees will not sting and can easily be brushed off.

13. Poisonous Insects.—In the tropics large centipedes and scorpions are found which can inflict painful, although not deadly stings. These insects like dark places, and may be found in blankets, clothing or shoes. Spiders of poisonous variety may be found in some jungle areas and although most of their bites are not serious, they are very painful.

Ants are a possible danger to injured personnel lying on the ground and unable to move.

14. **Leeches.**—Leeches are common to most jungle areas. They are found especially in swampy areas and streams of most jungle country. Although not poisonous the bite of leeches can cause infection if not cared for because the small wound made by the leech may provide a point of entry for the organisms which cause tropical ulcers or "jungle sores". All men should be on the alert for leeches on the body and remove them before they have a chance to bite. If they have taken hold of the skin do not pull them off forcibly but make them release their grip by touching them with a moist piece of tobacco mixed with red pepper, or by touching them lightly with the burning end of a cigarette or cigar.

15. **Care of Small Arms.**—Because of the high humidity in jungle country, the individual must be especially careful of his small arms. Unless all weapons are given scrupulous care and attention with daily cleaning and oiling, rust will render them unserviceable in a very short time. Each man is responsible for the weapon issued to him and must be cautioned to keep it ready for action.

a. Officers and non-commissioned officers must be alert to see that all weapons in their command are kept in a state of efficient readiness at all times.

16. **Expedients.**—Jungle conditions will require that the individual be especially adept at devising expedients to meet the varied situations that will arise. Of the many methods and devices that are most useful in the jungle, the following are of especial value:

a. Carry matches in a completely waterproof container, otherwise perspiration and the jungle humidity will soon render them useless.

b. Never go anywhere without a compass that you know how to use.

c. A good pocket or sheath knife is essential in the jungle as both a tool and a weapon.

d. A watch should be carried to help in estimating distance, direction, and to tell time.

e. Although running water is usually purer than still water, all water should be boiled or chlorinated before being drunk. Most mud and solids can be removed from water by straining it through a cloth or filtering through sand. (Refer to Marine Corps Schools Text, "First Aid and Field Sanitation.") When on the trail, the use of 2 or 3 drops of iodine per canteen is the easiest and most convenient method of purifying water.

f. Cardboard containers are undesirable for use in tropical climates because of the high humidity which will cause them to disintegrate rapidly.

g. In many situations it will be advisable for men to carry two canteens of water. At all times men must be careful to observe water discipline and use their supply sparingly.

h. Keep your shirt on. Tropical sun contains a dangerously high percentage of nerve destroying infra red rays as opposed to the health giving ultra-violet rays which predominate in more temperate climates.

i. Many jungle vines can be used in place of string or rope.

j. If you lose your matches or other fire making devices, a magnifying glass or lens (including most spectacles) may be used to start a fire by focusing the sun's rays. By shredding the dry, fibrous lining of bamboo stalks, a satisfactory tinder can be made. Dry leaves, grass, or the bark of some trees can also be used. Another method of starting a fire is by use of a cartridge. Remove the bullet from a cartridge; pour about half of the powder charge on the tinder you have selected; plug the end of the cartridge with an oily rag and fire upon the ground. This will usually ignite the oily rag.

k. To prevent hookworm, never go barefoot in the jungle.

l. When wounded or disabled move off the trail, out of sight and call for help in a quiet voice. Trails are good fields of fire—get off them when wounded.

m. To counteract the affects of early morning chill of the jungle, eat a hot meal and drink a hot beverage in the mornings whenever possible.

n. Sulphur taken internally or dusted in the socks and underclothing will help repel redbugs or chiggers.

o. Edible fruits and herbs can usually be identified by signs of animals having eaten them. Avoid eating unknown fruits and plants except in dire emergency.

p. If lost in the jungle remember that by going downhill you will ultimately reach a stream; by going downstream you will reach a larger body of water or inhabited valley. By having a proper knowledge and training in woodcraft, and by using your head you can travel and live in the jungle indefinitely.

CHAPTER III

JUNGLE DISEASES

SECTION 1

GENERAL

17. **General.**—The tropical jungle calls for many special safeguards beyond those of a tactical nature. For example, it is only through thorough training and correct precautionary measures that the deleterious effect of jungle climates can be minimized. Particular care must be taken against malaria, dysentery, and other tropical diseases. These require rigid training in, and adherence to, important sanitary principles. Men who are not accustomed to the tropics—and even those who are, including natives—are not capable of as much physical accomplishment in a given period of time as in more moderate climates and less difficult terrain. Inhabitants of the temperate zones, when transported to the tropics, require a period of physical adjustment to the increased heat and humidity and the greater power of the sun's rays before they can undertake long periods of hard physical exertion without discomfort and loss of efficiency. All these things a commander must take into account in conducting his forces through the rigors of a tropical campaign.

SECTION 2

DISEASES

18. **Insect and Animal-Borne Diseases.**—Insect and animal-borne diseases are those in which the agent that causes the disease is transmitted from man to man by a bloodsucking insect or animal. The causal agent may be introduced into the blood stream or tissues of man during the bite of the infected insect, or it may be deposited upon the skin by the insect during the process of biting or stinging. The irritation resulting from the insect bite causes scratching and inoculation of the wound with the infectious matter. It is necessary, therefore for all troops to exercise every precautionary and preventive measure in order to avoid infection. Some of the carriers of these diseases which may be met in jungle operations are:

a. **Mosquitoes.**—(1) Type: *Anopheles*, *Aedes*, and *Culex*. These mosquitoes transmit malaria, yellow fever, dengue fever, and filariasis. To combat the menace of these diseases to troops in the jungle, any collection of water should be examined as a breeding place of the mosquito. In a stable situation it is essential that such breeding places be denied the insect by drainage, use of oil, and by safeguards designed to prevent the collection of stagnant pools of water in gutters, containers, or low ground in the zone of operations. However, since jungle warfare is largely one of movement, the control of mosquito borne diseases will be based largely upon protection of the men from bites by the use of netting, salves, repellents, and inoculation.

b. **Ticks.**—Ticks transmit the following diseases: Relapsing fever, Texas, Mexican, Central American, South American, and African types; Sao Paula typhus; South African tick typhus; Indian tick typhus; Kenya tick typhus; and Fievre boutonneuse. Frequent inspection of exposed skin surfaces and the prompt removal of ticks is essential in those jungle areas where ticks are found. Care must be taken that the entire tick is removed without leaving the mouth parts in the bite, or squashing the tick in the process. The application of alcohol or ether on the tick will cause it to relax its hold permitting its safe removal. Antiseptic measures should be taken immediately after the removal of the tick to prevent infection from the wound. Native buildings and animals in tick infested areas should be avoided. When native villages are to be occupied by troops it is usually best that the area be burned before its occupation.

c. **Fleas.**—The rat flea is the most common carrier of bubonic plague, endemic typhus and other typhus-like diseases, although the fleas of other rodents may also transmit these diseases. Since rats are the usual host of fleas, the elimination of these rodents is the best preventive measure. Food

should be stored so that rats cannot get to it, and all garbage should be burned. In camps, trapping and poisoning should be resorted to as soon as rats appear. Native buildings should be avoided or burned since they will often be overrun with rats.

d. **Mites.**—Mites transmit tropical, scrub, Malaya, and Sumatra typhus. The use of repellents by the individual is the only control measure. Among the effective repellents are sulphur ointment, pine oil, and rotenone. Ten grains of flowers of sulphur or powdered sulphur taken internally prior to entering the field each day will act as a repellent because of the hydrogen sulphide then excreted in the perspiration.

19. **Water-Borne Diseases.**—The principal diseases in this group which occur in the tropics are amoebic dysentery, bacillary dysentery, cholera, helminthic infection (worms), paratyphoid fevers, protozoal dysenteries, typhoid fever, and undulant fever. These diseases are usually transmitted by eating or drinking contaminated food or water.

a. In the jungle, all perishables which cannot be stored in a refrigerator below 40° F. should be cooked immediately upon receipt, except that frozen meat should be cooked immediately after thawing. All nonperishable foods should be stored in vermin free boxes or chests. Every precaution must be made to prevent contamination of foodstuff at all times. It is essential that no water be drunk or used in cooking which has not been properly treated to render it free of infectious content.

20. **Fungus Diseases.**—Dhobie itch, athlete's foot, pinta, (a fungus disease of the skin which is characterized by pigmented patches) and trichosporosis, (a fungus disease of the hair) are the principal fungus diseases.

a. These diseases may be avoided by personal cleanliness. The body should be bathed as frequently as possible. The armpits, groin, and feet should be given especial attention and washed daily with soap and water. Foot powder used under the arms, about the groin, and between the toes will help prevent fungus disease. Socks should be washed daily, if possible, in boiling water. At the first symptom of fungus infection, prompt use should be made of the prescribed medicine carried in the individual or group first aid kits. In the event of excessive inflammation or itching, a medical officer should be consulted as soon as possible. Frequent inspection of the feet of the men should be made by the officers to insure early treatment.

21. **Snake Poisoning.**—In many jungle areas poisonous snakes will abound. Each man should be instructed in the identification of such snakes as are likely to be met, and have a knowledge of the prescribed methods of first aid for snake bite. (Refer to Marine Corps text, "First Aid and Field Sanitation," Para. 37 a & b—FM 31-20, Para. 14.)

CHAPTER IV

THE ARMS

22. Infantry.—Infantry is the general purpose arm in jungle warfare. The nature of jungle terrain is particularly suited to the movement of lightly equipped troops armed with weapons which can be brought into action immediately. A compromise must be made between mobility and armament which will result in a highly effective fighting force able to move with stealth and speed to strike sharp, telling blows where the enemy least expects it.

a. Combat will frequently resolve itself into a series of personal encounters between individuals or small groups. For this reason, every man must be trained in hand-to-hand fighting and be proficient with the rifle, automatic weapons, bayonet, and knife. The entire command must be trained to withstand protracted periods on limited rations and water under strenuous field conditions. The arduous aspects of jungle warfare will make it mandatory that all men so engaged be in excellent physical condition.

b. Because of heavy undergrowth, obtaining optimum fields of fire for the specific weapon employed is quite often impossible without extensive clearing of fire lanes. Along jungle trails fifty yards is generally the longest field of fire that will be available. On the other hand, excellent fields of fire may be found on the open ridges often found in jungle country, or along streams in the upper reaches where they have a straight-a-way run for some distance. Since most jungle combat will be at extremely close range and practically all targets will be those of opportunity only, light weapons capable of a heavy fire power should be extensively employed. Instruction in "snap shooting" should be stressed in the jungle training program.

c. Scouting and patrolling must be emphasized in training. Practice in quiet movement and observation in heavily wooded areas will prevent casualties later from enemy ambush. The jungle terrain is particularly suited to the employment of ambush; therefore troops should have a knowledge of the most effective methods of ambushing the enemy as well as an instantaneous, aggressive reaction to similar activity on his part.

d. All units and individuals must be impressed with the importance of maintaining all-around, continuous security against attack from any direction. In terrain where movement by the enemy is largely screened by the profuse vegetation, patrolling must be continuous to the front, flanks, and rear.

e. In jungle operations the tactics and methods of the early Indian fighter can be applied most effectively to infantry—stealth, cunning, deception are enhanced by the nature of the jungle and should be employed to the utmost.

23. Field Artillery.—In relatively stable situations, field artillery supports infantry in jungle operations much the same as in operations in more open country by utilizing the range and flexibility of its weapons. Its fire is particularly effective in heavy woods or jungle due to the high percentage of tree bursts against which overhead cover is necessary for protection of personnel.

a. In moving situations, the availability of field artillery will depend largely upon the existence of suitable roads and trails. Roads must be available to move the motorized equipment of the organic field artillery of the Marine Infantry Division. Pack artillery can move over trails with the same mobility as infantry supply elements. In continuous action, the limited organic transport of Marine field artillery units makes ammunition supply a major problem at distances greater than five to eight miles from a base of supplies, in which case additional transport is required.

b. The serious limitations to observation in the jungle will require that forward observers operate with the most forward infantry elements. In many situations it is desirable to provide forward observers in larger numbers than the tables of organization specify, in order to adequately cover densely wooded terrain. Observers, liaison, and intelligence personnel should participate in patrol activities in order to thoroughly familiarize themselves with the zone of action. Efficient intelligence work is invaluable, particularly in placing unobserved fires on enemy positions such as assembly areas, bivouacs, command posts, supply installations, and routes of communication and supply.

c. Efficient communication between artillery and infantry units is of the utmost importance in all jungle operations. Limited visibility will require the extensive use of all means of signal communication to maintain contact between these arms and between batteries. It is important that sufficient liaison personnel operate with regiments and smaller units to enable supporting batteries to be brought into action quickly when they are needed.

d. Due to the usual absence of definite lines and fixed positions, and the inherent instability of jungle warfare, field artillery positions must be such that wide zones of fire, sometimes as much as 360 degrees, can be covered. This involves the use of additional emplacements to permit batteries to change front, formations permitting all-around fire, and facilitate free movement to nearby alternate positions. Clearings must be available for battery positions. If no suitable clearings are

available they must be cut. Such cuttings must be concealed by careful camouflage utilizing naturally growing vegetation whenever possible since cut vegetation will wither rapidly in the intense heat. Artillery positions must be closer together in jungle country than in more open terrain in order to properly provide for local security against infiltrating enemy troops. Although local security is coordinated with the general security plan of the force in the normal manner, field artillery units must rely less on the presence of other troops and more upon integral security detachments from each battery.

24. Mechanized Units.—In heavily wooded jungle mechanized units will have limited combat effectiveness, although they can be used to advantage on beaches, grassy ridges and other cleared terrain which will be found usually in jungle country. Seldom will roads be found which will permit the passage of armored wheeled vehicles without some improvement. When mechanized units constitute a part of a force operating in jungle areas, pioneer troops should be attached to the mechanized elements to cut passage through jungle obstacles and improve roads essential to the wheeled elements of the command. The abundant concealment offered to enemy tank destroying units will require that all tanks operate with mutually protecting infantry.

25. Engineer and Pioneer Troops.—It is essential that Engineer and Pioneer Troops accompany all jungle columns. They will be used to construct bridges, prepare obstacles and demolitions or clearing of obstacles, trail making and maintenance, water purification, and the construction of permanent emplacements and defensive works. When air support is assisting infantry, these troops will often be required to clear and prepare landing fields and construct runways.

26. Aviation.—While conditions of observation will limit somewhat the use of aviation in the jungle, this arm will be an invaluable support to the operations of infantry. Aviation will be used to strafe and bomb enemy positions, protect troops from enemy air attack, naval bombardment, and observation, as well as to conduct both close and distant reconnaissance missions. Both land and carrier based planes are employed to soften enemy shore defenses in the establishment of beachheads, and to cut off and destroy enemy supplies and reinforcements coming in by land or sea. As a vital factor in the supply and evacuation of troops in the jungle aviation is becoming increasingly important. Aviation is used advantageously to transport troops, artillery and supplies when other methods are either too slow or impossible because of the nature of the terrain or enemy action.

a. Great care must be taken in the employment of aviation on close support missions in the jungle. Unless there is a natural boundary such as a river, edge of clearing, ridge

line, etc. to mark the lines, it is dangerous to request strafing and bombing missions against enemy positions, since panels will seldom be visible and planes cannot distinguish friend from enemy.

27. Parachute Troops.—Parachute troops are used effectively to reinforce jungle columns, to carry out raids on enemy supplies and installation in the rear, and to establish beach-heads and bridge heads. Although these troops may land with comparative safety in the jungle, it is usually preferable that cleared ground be chosen for the landing to facilitate the rapid assembly of troops in a minimum of time.

CHAPTER V

SECURITY

28. **General.**—In jungle operations the conventional idea of the front and flanks must be discarded. Seldom, if ever, will there be lines defining a “no man’s land” between friendly and enemy positions. Flanks can never be considered secure and safe against encircling movements by the enemy. In such regions as the jungle where covered routes of approach abound and offer excellent opportunities for infiltration, security must be maintained continuously by all units. Security will embrace all measures taken by a command to protect itself from observation, surprise and annoyance by the enemy, and includes also those necessary to obtain freedom of action for itself. No matter how remote from the foremost troops a unit may be, it is always in danger of observation and attack at any time. Every officer and man must have his assigned post in event of enemy attack. This applies to all headquarters and supply installations as well as combat troops. Men must be impressed with the importance of unceasing vigilance; special measures must be taken to minimize infiltration through our lines.

29. **Counter-Reconnaissance.**—To overcome the liabilities of the terrain, counter-reconnaissance measures must be extended to cover all possible routes of approach which offer concealment to enemy patrols. By the use of wire and other obstacles, booby traps and road or anti-personnel mines, the movement of enemy groups toward our position can be canalized to some extent. All obstacles must be covered by the fire of automatic or antitank weapons. Outposts should be numerous and supplemented by highly mobile patrols whose mission it is to maintain contact between outposts, intercept enemy infiltration and keep under surveillance the entire front, flanks and rear of the position. Jungle outposts must be strong and armed with a high percentage of light automatic weapons. They should be well concealed for their best security lies in denying the enemy knowledge of their location. Supplementary positions should be prepared for occupation at night. Every effort should be made to provide outposts with sufficient signal communication equipment to enable them to maintain contact with higher echelon at all times.

30. **Maintenance of Initiative.**—Maintenance of the initiative is the best form of mental and physical security. The enemy is then forced to conform to our movements and must hold his troops in a position of readiness. Even when our mission is of a defensive nature, the initiative can be denied the enemy by utilizing the offensive in local and general counter-attack against him.

31. Antiaircraft Security.—In a moving situation in jungle operations, it will often be impossible for antiaircraft artillery to keep up with the column; therefore all units will provide for immediate protection against low flying attack aviation by using their own weapons which are suitable for that purpose. The concealment offered by jungle growth provides a great degree of passive protection to troops against enemy aviation, and it should be a general rule that all men will withhold fire unless discovery is certain.

32. Antimechanized Security.—The limitations which jungle terrain imposes on the operations of mechanized units will simplify the details of antimechanized security. Approaches such as roads, improved trails, stream-ford, etc., which lead into positions along the outskirts of the jungle should be blocked by antitank obstacles and mines which are covered by fire. Individuals should be trained to make the maximum use of the concealment which the jungle affords foot soldiers in fighting tanks. This terrain favors the action of small units utilizing explosives, "Molotov Cocktails", and other expedients for destroying tanks.

CHAPTER VI

MARCHES AND BIVOUAC

SECTION 1

MARCHES

33. **General.**—Marches in jungle operations will be affected by the size of the unit involved, capacity and number of trails, distance to be covered, season of the year, methods for supply and evacuation and means of transportation. It is essential that all movement in the jungle be planned carefully in advance with these factors in mind. Route reconnaissance and a study of maps and aerial photographs will enable the commander to select routes offering the least physical resistance to his troops. Native guides, when they are available and considered reliable, will be of assistance to troops on cross country movements.

34. **March Instruction.**—Before beginning a march in jungle operations each man should know: the formation, what action to take if attacked, and what to do when the objective is reached. It is essential that every man who has a map know the compass bearing to be used and the distances to be marched on each bearing in order to arrive at the objective. Since jungle combat requires a great measure of individual initiative and independent action, the entire command should be informed of the situation as it affects them in order to insure concerted action by all units.

a. The formation to be adopted will depend largely on the terrain. Limitations of visibility will usually require that units adopt formations which are relatively vulnerable to enemy fire in order to provide adequate control of the column. Most movement will be on or astride roads and trails which are, for the most part, cut through dense jungle growth. Such being the case, troops will deploy only as much as practicable to retain control and mobility. Whenever possible units should be reinforced by attaching elements from weapons companies to enable them to function as efficient combat teams in event of sudden attack. To increase mobility, light machine guns are preferable to heavy machine guns which may slow the progress of the column. If it becomes necessary to move off the trail the light machine guns can be more easily man-handled than the heavy guns, and can accomplish the same missions covering the march.

Commanders must be well forward with their units where they can maintain control in any situation with no loss of time. Trains are located centrally in the column, while the rear should be protected by rifle units, reinforced with

machine guns guarding against attack from that direction. (See Small Wars Manual; 1940.)

(1) Because heavy growth along trails will make it difficult for flank patrols to keep up with the column, security on the flanks will depend mainly on the vigilant and constant observation of all members of the command. Flank security units should be sent out to cover all lateral trails until the column has cleared open areas should be reconnoitered by scouts before the column is allowed to cross them. On jungle trails men must be prevented from bunching up. It is especially important that the point be well dispersed in length to the limit of visibility in order to prevent multiple casualties from a sudden burst of fire along the trail, preserve the point as a fighting unit in case of attack, and confuse an enemy which habitually holds its fire until the point has passed.

35. Meeting an Ambush.—The best preparation against the disorganization and demoralization of troops who may be ambushed is to prepare them mentally for the shock of an ambush. They must be steeled to withstand a sudden blast of fire at close quarters and to react to it in a manner which will unnerve the enemy. To accomplish this troops must have a thorough understanding of what is likely to happen when ambushed and be trained to react aggressively and positively to meet the situation.

a. To assure coordinated action within each unit, prior to the march subordinate elements should be assigned sectors or areas of responsibility. When fired upon, troops at once hit the ground and crawl or roll to cover, and each subordinate unit faces the sector for which it is responsible. The fire will be returned immediately by all men who have located a target within their area of responsibility. Leaders will gain control of their units and commence to put into effect the prearranged scheme of maneuver which the situation indicates. This scheme of maneuver will cover supply trains, automatic and supporting weapons, and rifle units; it will determine the manner in which the maneuver group will be selected. That unit which is in the best position to disengage itself from the fire fight and move into a position from which the ambush can be outflanked should do so of its own initiative, and attack aggressively under the covering fire of other elements of the column.

36. Trail Cutting.—In many cases it will be necessary for jungle columns to cut new trails to accomplish their mission. Trail cutting is done by teams with a leading cutter charged with direction on an azimuth or previously determined direction followed by a second cutter who widens to the right, a third who widens to the left, and so on depending on the

number of cutters and the width of the trail desired. Map reconnaissance to determine the best and quickest route should be made previous to beginning the march. Selection of the route will be determined largely by the ease with which the trail can be cut. Slight detours will often save time, while zig-zagging trails up steep inclines will be easier to traverse than a straight trail. Frequent rotation of cutters within each small unit or detail will speed the cutting of the trail and bring relief to the cutters. (See Appendix I for rate of trail breaking and clearing.)

SECTION 2

BIVOUAC

37. Requirements.—Three essential requirements of a bivouac area to be occupied by troops on the march are: that it be a good natural defensive position where the security of troops can be maintained, especially during the hours of darkness and dawn; that it facilitate the distribution of supplies; that it serve as an initial point for the next days operations. Patrols which precede the main column should select and reconnoiter the bivouac area, lay it out and partly clear it, if possible, before troops move in.

a. The bivouac should be selected primarily for its value as a defensive position. The ideal area will be close to a water supply and on high, well drained ground which provides ample overhead concealment to troops from enemy aviation, and is surrounded by wide cleared spaces offering favorable fields of fire for rifles and automatic weapons. When no overhead cover exists, troops should move into the bivouac after dark.

Since optimum fields of fire will seldom be found in the jungle, the clearing of fire lanes should have a high priority in the establishment of the camp site.

b. The bivouac defense must be planned to give all around protection to the troops which will occupy that area. Machine guns and automatic weapons sited on the perimeter of the area will provide close-in protection. The fire of these weapons should be as mutually supporting as possible. This will require extensive clearing of fire lanes placed to enfilade an attacking enemy. Riflemen and automatic riflemen should be spotted to protect those areas unable to be covered by machine guns. Beyond this band of defensive fires will be an outpost composed of small listening posts and observation posts supplemented by highly mobile patrols. Extensive patrol activity is necessary to protect the small isolated posts, and may serve to mislead the enemy as to our disposition. The use of night patrols will call for highly trained personnel and definite plans of action. The patrol plans should be known by all friendly troops, otherwise there is danger of troops firing upon their own patrols, or letting infiltrating groups of the enemy pass through the lines believing them to be a friendly patrol.

The intervening area between the outpost line and automatic weapons should be organized with booby traps, trip wires, flare disks and similar devices designed to protect and warn troops against enemy infiltration. It is imperative that all bivouacs be organized in depth with a highly mobile, central reserve held ready in case of enemy break-through. To facilitate organization and control, the bivouac should be divided

into compartments which are allotted down to the squad. Within the bivouac area a minimum of movement should be allowed. Strict care must be exercised to see that no men make unnecessary noise or use lights of any kind.

c. All troops must dig slit trenches or individual fox-holes as protection against enemy mortar, artillery, and rifle fire. Troops on the perimeter should be liberally supplied with hand grenades which are especially effective for dispelling night attacks. In event of an attack only volley firing, controlled by responsible leaders, should be allowed. Every precaution must be taken to prevent indiscriminate firing for this will result in the premature disclosure of our positions, waste of ammunition and possible casualties among friendly troops. All men must be trained to hold their fire until they are reasonably sure of their target, refusing to be duped by enemy diversions designed to force them into disclosing their position.

CHAPTER VII

ATTACK AND DEFENSE

SECTION 1

ATTACK

38. **Forms of Attack.**—Jungle terrain lends itself favorably to the two main tactical maneuvers: envelopment and the penetration.

a. The penetration is particularly suitable for use against an enemy position which aims at attaining width and security of flanks by the sacrifice of depth. This attack must be made on a narrow front with one or more spearheads driving in to a given objective. When used in conjunction with infiltration the penetration can achieve the best results. Lightly equipped troops infiltrating in advance of as well as to the flanks of the main attack create and exploit weak points in the enemy lines, permitting the main effort to drive into the breach thus developed.

b. Because operations in the dense jungle present an almost impossible task in locating exactly the enemy flanks, enveloping actions should be habitually wide with the mission of driving past the flanks to hit him deep in his own territory. The envelopment, to be successful, must be made quickly by highly trained troops capable of rapid movement across country, and able to sustain themselves for long periods on limited supplies. This force should avoid contact and interference with enemy patrols during the approach march as this will entail loss of speed, surprise, and minimize control. The envelopment in depth, characterized by separate columns fanning out and encircling the enemy's rear to strike a succession of blows deep in his territory, is especially effective in jungle combat. The presence of navigable streams or open water areas on the enemy flanks may provide a favorable avenue of approach for the enveloping forces if water transport is feasible.

39. **Formation.**—The formation for the attack will, of necessity, be one which permits the maximum of control and maintenance of direction as well as security and the ability to deploy rapidly. Such requirements will usually necessitate a compact column formation, or where trails are available, a series of parallel columns. Supporting weapons should be so distributed that smaller units will be efficient, independent fighting teams, ready and able to attack with a minimum of delay. When close to the enemy, trails parallel to the axis of advance should be used to widen the front of the attack as well as provide flank security for the attacking force. In light jungle it is generally better to cut new trails when in proximity to the enemy to

permit a partial deployment of the attacking force. It is essential that in this stage of the attack that the plan of attack be understood by all members of the command. Each subordinate unit must have its own definite assigned objectives at which they will reorganize and advance on orders or according to plan. Such objectives will ordinarily be more limited and closer together in jungle warfare than in other types of combat.

b. Further deployment of the separated columns should not be made until contact with the enemy has resulted. At this time units must complete the deployment quickly and attack aggressively. To gain the initiative it is essential that the initial action be pushed vigorously to deny the enemy time to recover and counterattack. Full use should be made of all supporting weapons before and during the attack. Troops should be alert to take advantage of the time interval after the supporting fires have lifted to press the attack against the enemy.

40. **Reserves.**—Great care must be exercised when an objective has been taken that all the enemy pockets are wiped out. It will be comparatively easy for numbers of the enemy to lie undetected until the attack has passed by unless positive measures for their elimination are taken by the reserve following closely behind the attacking echelon. Reserves must follow the assault echelon closely and in a condition of readiness to be committed at any moment after the attack begins. For this reason it is necessary that the commanders of reserve units be familiar with the ground and progress of the attack at all times so that they will require a minimum of time for reconnaissance and the issuance of orders when the reserve is needed.

SECTION 2

DEFENSE

41. **General.**—Static defensive tactics are not favored in jungle warfare since the factors by which jungle operations differ from other operations will greatly limit the use of those defensive tactics that rely on mutually supporting terrain features held by relatively few men, supported by machine guns and other automatic weapons of great fire power. Seldom will such mutually supporting localities be found in the jungle, and the use of automatic weapons on final protective lines is greatly restricted. Concealed avenues of approach, on the other hand, will abound, making conditions for the attack ideal. The flanks of a defensive force can be kept under observation only with great difficulty; they can never be considered secure. Wide streams, or areas of open water on one or both flanks of a position should not lead to a false sense of security. It must be expected that an alert, aggressive enemy will employ waterborne troops to outflank or encircle the position. Not only must the commander assure positive observation means, both ground and air, to warn of such attack, he must also be prepared to meet and destroy such attempts by the enemy.

a. When conditions make it impossible to seize the initiative at once, units may be forced to take up defensive positions, or in the course of offensive operations it may be necessary to pause and consolidate a position while communications are improved and supplies replenished. It must be appreciated at this time, however, that the defense will fail if it remains static. A successful defense in jungle combat must be offensive in spirit, utilizing combat patrols, local offensive actions, counterattacks, and the constant improvement of position. Secrecy must be utilized to the utmost by the defender through skillful use of camouflage, concealment of the location of reserves, frequent shifting of gun emplacements, and active counter-reconnaissance measures.

42. **Discussion.**—Jungle defense is all around defense. From the highest to the lowest, units must provide for all-round defense of their positions. Where cover and concealment abound in such profusion as in the jungle, an aggressive enemy may be expected to hit from any direction. It will be virtually impossible to prevent the infiltration of small enemy units; therefore troops must be prepared at all times to meet him in unexpected places. A defensive position in the jungle must be as closely knit as the terrain dictates. In particularly heavy jungle country, this may call for a "shoulder-to-shoulder" disposition of the defending troops. Other terrain may be adequately defended by troops posted to defend points which block avenues of approach, tied together by highly mobile patrols designed to maintain contact between units as well as guard against an

enemy break-through along less likely routes to the position. To achieve any degree of success all jungle defense must be organized in depth. Positions must be backed by deep, highly mobile, numerous, local reserves, with a general reserve of sufficient strength and maneuverability to move rapidly and counter an enemy break-through at any point on the perimeter. The exact location of the local reserves is dictated by their mission: to support the forward defense areas by fire; to make local counterattacks to eject an enemy who has entered the forward defense areas; to prevent further advance by the hostile force. When an attack by the enemy has been successfully repulsed, mopping up parties should be sent out to comb the position for any enemy which may have remained in hiding on or near the position.

43. Preparation.—In the preparation of a defensive position in the jungle, extensive fields of fire must be cleared to increase the effectiveness of the defending weapons. Insofar as possible, lanes should be cut which will place attacking enemy ranks under enfilade fire by automatic weapons. When cutting these lanes the bottom branches of trees, and low vines and undergrowth should be cut leaving the upper branches to prevent hostile ground and aerial observation of this part of the defensive scheme. Barbed wire double apron fences and protective wire should be used extensively on the front, flanks and rear of the position. Devices such as tin cans filled with small stones, booby traps, etc., should be placed along the wire to warn of any enemy interference. The use of the Concertina is recommended because of the heavy gage wire which makes cutting difficult. By the extensive use of wire and other obstacles, covered by fire, the enemy will be forced somewhat to conform to our defensive position, and thus relinquish some of the initiative he holds as the attacker.

a. All men must dig in. The slit trench and the standing type foxhole with an overhead covering which offers protection from grenades have been found most suitable for jungle combat. When the situation permits, all troops should dig supplementary and alternate positions to guard against attack from any direction. In many cases it will be expedient to prepare night positions to the rear of that position occupied during the day. This will confuse the enemy and make reconnaissance preparatory to an attack difficult. Riflemen should be situated in trees or well concealed foxholes to intercept any enemy attempt to infiltrate into our positions for the purposes of destroying automatic weapons. All positions should be carefully camouflaged, utilizing the abundant materials easily obtainable in the jungle. Whenever possible live vegetation should be used in preference to cut vegetation which will wither rapidly in the jungle climate. Artificial means of camouflage colored green with a high content of yellow to blend with the jungle will be satisfactory when natural means of camouflage are not practical.

b. Because of the extensive clearing which must be done in the preparation of fields of fire, the normal engineering tools provided for a force preparing a defensive position should be augmented by axes sufficient to provide at least 25 percent of the command. Each jungle soldier should be equipped with a machete. A soldier trained in the use of the machete and axe can, with these two tools, completely clear 100 square yards of trail or about 200 square yards of fire lane in five hours. (See Appendix I.)

c. Security detachments should be placed along all avenues of approach to the defensive position to observe and delay a hostile approach. Patrolling must be active both along the approaches and between security detachments, since the characteristics of jungle terrain permit easy capture or destruction of isolated forward elements. These security elements should vigorously oppose an advancing enemy, denying him the use of trails or other routes of approach, forcing him to deploy prematurely, and inflicting as many casualties as possible.

CHAPTER VIII

SPECIAL OPERATIONS

44. **Patrols.**—In jungle combat the security and effectiveness of both the defender and attacker will depend largely on the activity of their patrols. Patrols have three paramount missions: to deny the enemy access to certain terrain; to secure information; and to harass the enemy.

a. The security patrol will operate to intercept, delay or break up the enemy movements which threaten the front, flanks or rear of the main force. These patrols must be maintained continuously and must be aggressive, mobile units if the initiative is to be gained or retained.

b. Reconnaissance patrols will function in the jungle in much the same manner as in other operations. Since events move so rapidly under jungle conditions, special means for signal communication must be employed to enable the commander to act on information received. The use of the portable radio, pyrotechnics, flags, etc., depending on the particular situation will greatly increase the effectiveness of the reconnaissance patrol.

c. The combat patrol operates with the mission of harassing the enemy by operations against his lines of communication, supply installations, flanks and rear. These operations delivered with speed and pushed aggressively serve to demoralize the enemy, weaken his will to resist and deplete his forces. Jungle terrain makes the efforts of combat patrols especially valuable, enabling small, lightly equipped patrols to move rapidly around the enemy flanks or through his lines, to strike punishing blows where he least expects it. The strength and composition of the combat patrol will be dictated by the mission assigned and the terrain. The size usually will approximate at least one platoon, equipped with a high percentage of light, automatic weapons capable of delivering heavy fire. Formations for the combat patrol are based upon concentration and all around security. The leader must be able at all times to insure the quick and coordinated action of all his men and to meet an attack from any direction.

(1) Orders must be based upon the greatest possible advance information. They must contain much detail and at the same time must provide for independent emergency action by small groups if the necessity for such action arises. It is imperative that members of the patrol have all available information in advance regarding the mission, the route both to and from the objective and any rendezvous which may be prescribed. The tactics of the combat patrol are based upon surprise. It will move with stealth and take all measures necessary to preserve the secrecy of its movements.

(2) In jungle combat there should be little distinction made between "combat" and "reconnaissance" patrols. To restrict a patrol leader to pure reconnaissance (except in isolated instances) is to hamper seriously and even endanger that patrol. Jungle patrols must be aggressive when the situation demands; it is often their only means of defense. A patrol should always seek information, but likewise, it should seek to cause as much discomfort to the enemy as possible.

(3) Unit leaders should be alert to observe those men in their command who show a natural inclination toward scouting and patrolling. These men usually will be those who have grown up in country surroundings, are used to hardships, and clever in woodcraft. Thorough preparation of the entire command in patrolling is a prime requisite for all jungle combat. A high percentage of patrol training should be undertaken at night with stress placed on silence in moving through heavily wooded terrain, swift marches under the most difficult conditions and operating over long periods of time on limited rations and supplies. All patrol members as well as all combatants in jungle operations must be impressed with the importance of patience under the most adverse conditions. When the natives of the particular theater of operations are known to be friendly, every opportunity should be made to use their knowledge of the terrain by our patrols.

45. Night Attacks.—The factors which make a night attack difficult in normal operations are accentuated in jungle combat. Vision, control, coordination and secrecy are much more difficult to attain in the closed, heavily wooded terrain present in jungle combat than on more open terrain. Night will increase the difficulties so much that such operations will be of limited value in most jungles. Night attacks will be made by smaller units operating over terrain through which selected routes have been reconnoitered. Trails, streambeds or similar features easily identifiable and followed at night should be employed. Extra time must be allowed for the delay of columns caused by the increased lack of vision and the obstacles to control and maintenance of direction which the jungle imposes.

46. Ambushes.—In the jungle where concealment is easily obtained and where movement is closely restricted, ambushes may be employed with good effect in either defensive or offensive operations. A correctly organized ambush must take several factors in consideration: Location, concealment, depth, field of fire and route of withdrawal.

a. The location of the ambush will be determined by exacting reconnaissance of enemy supply routes, trails, etc., as well as an appreciation of the terrain, in order to choose a location which will provide the most profitable targets to the ambushing group. Suggested ambush locations are twisting trails, water points, enemy defensive positions occupied only when the area defended is threatened, supply routes used by

carriers and jungle stream trails. In any of these locations it is often possible to ambush large enemy parties, patrols, or supply convoys.

b. Concealment is highly necessary in ambush operations as any suspicious appearance will foil all ambush attempts against an alert enemy. Strict measures must be taken to prevent men from littering the area of the ambush with cigarette butts, paper scraps, ration tins, footprints and bruised and broken vegetation. All members of the ambush party must be trained in camouflage discipline and patience, for a high degree of both will be required in a successful ambush.

c. By depth of ambush is meant the distance which the enemy must penetrate into the ambush position before his leading elements pass out of the line of fire. This depth will depend upon the size and formation of the enemy party that is to be trapped. When the enemy is fully in position, there must be fire both in front and behind him to prevent his escape in either direction.

d. It is seldom possible to place weapons in an ambush so as to make use of the optimum field of fire for each. Every effort should be made to bring point blank fire to bear on the enemy if possible. In this way the fire itself will be extremely effective and the attendant roar of weapons will add to the confusion of the enemy making his capitulation or annihilation more probable.

e. Careful consideration must be given to the route of withdrawal to be employed by members directly after the ambush. The threat of enemy reprisal in force makes it mandatory that one or more favorable routes of withdrawal be designated to a previously determined assembly point. Provisions should be made for the order of withdrawal to provide a covering force whose mission it is to protect the orderly withdrawal of troops to the assembly point.

47. Attack and Defense of River Lines.—The general doctrines of attack and defense of river lines are discussed in Marine Corps Schools text, River Crossings, and FM 100-5. Jungle conditions will usually modify the tactical application of these doctrines as follows:

a. **Attack.**—Because of the difficulty which will be encountered in cutting numerous trails to the riverbank, with a resultant loss of time and surprise, most attacks on a river line will be on a narrow front. Reliance must be made on speed, surprise and firepower. Feints will be practical only on a more limited front but should not be omitted for that reason, because concealment afforded by the jungle can often be used to get small groups across secretly, and the confusion and uncertainty that small harassing groups can cause may

be of decisive importance in assisting the crossing of the main effort.

(1) Much of the material for bridging and ferrying may be obtained locally in the jungle. Seldom will it be possible for ponton trains and other engineering equipment to accompany the column. Reliance should be made on stream crossing expedients for the initial stages of the attack.

(2) Usually the supporting fire of light automatic weapons only will be available. These must be placed along the near bank itself to obtain observation. Weapons will usually have to be manhandled into position through the jungle and time for such movements must be allowed unless the attacker relies solely on the surprise of a quick rush from the point where his trail meets the stream, supported only by the fire of such weapons as can be quickly emplaced near the trail.

b. **Defense.**—(1) In jungle warfare the main line of resistance will often be placed along the riverbank since—

(a) The jungle and usual lack of trails, roads and other routes of movement are deterrents to rapid counterattack or movement of rearward reserves; therefore, it is undesirable to permit the enemy to gain a foothold on the defender's side of the river.

(b) Positions for supporting weapons ordinarily can be found only on or close to the river bank itself.

(2) Suitable areas for crossings by the main attack forces ordinarily will be fewer in number than in more temperate climates and more thickly populated areas. However, the advantages of concealment and cover favor the crossing of small groups at any point.

(3) The defender must provide protection for his flanks and rear. The ease with which small, highly trained groups can cross and operate stealthily in the jungle area to harass troops and damage or destroy installations requires that special measures be taken to protect against such hostile elements.

CHAPTER IX

SIGNAL COMMUNICATION

48. **General.**—The characteristics of jungle warfare will tend to increase the importance and use of signal communication. Since the transmission of orders and enemy information is vitally important, means of communication should be increased above the normal allotments to units. Reliance should not be made on any one means of communication, for coordinated action by troops in jungle combat will require that communication facilities operate at all times.

a. The care of signal equipment is of great importance, especially in the rainy season. Prior to beginning jungle operations, every possible measure should be taken to dry out and protect equipment. Electrical equipment requires special care. If waterproof covers for electrical instruments are not issued, they should be made from salvage material such as raincoats and tentage. Signal equipment should never be placed on the ground. All pack animals carrying signal equipment must be led by hand. Frequent inspections should be made to determine that the equipment is traveling securely. Frequent testing and examination of all equipment should be made whenever time and the situation permit.

b. Work at the message center must be done under adverse conditions in the jungle. All message center personnel must be trained to work with headnet and gloves. Due to the heat it is seldom practical to use closed tentage. All lights must be adequately shaded or concealed to prevent hostile observation. The jungle offers abundant material for the camouflage of message centers which should be utilized extensively to preserve the secrecy of its location. All message centers must take special measures to provide their own security. An alert enemy will infiltrate to command posts by following signal communication wire, therefore care must be taken by the message center and adequate security be posted to prevent hostile infiltration.

c. The messenger is the primary and most reliable means of signal communication in jungle warfare. They should be carefully selected men, with a high degree of intelligence, courage and aggressiveness. Their training should include instruction in jungle lore, trail knowledge and the use of the marching compass. All messengers must be kept familiar with the location of adjacent units. In many cases under severe jungle conditions it will be necessary to employ messengers in pairs. As added security it will be best to send identical messages by different messengers traveling by different routes.

d. Although visual means of signalling will be of little value in the jungle itself, when sufficient open space or high

ground exists these means may be employed to advantage. Pyrotechnics will be less reliable in the jungle because of the humidity, therefore their use should be supplemented by other signalling devices whenever possible.

e. Atmospheric conditions and jungle growth will limit the range of radio. Light portable radio sets employing hand generators and fishing pole antennae are necessary. Because of their weight and bulk, the use of large and more powerful sets will be confined mainly to areas immediately adjacent to trails and to rear areas. Continuous-wave signals provide greater range and are preferable therefore to voice or tone modulated signals.

f. It will often be impossible for wire communications to keep up with troops in the attack. In the defense, however, wire communication is indispensable, and should be laid to connect all echelons in such a way that constant contact is maintained between units. Wire will often be threatened by small infiltrating groups, therefore whenever time and the situation permit all wire must be concealed. Dummy wire and booby traps may be used against infiltration to mislead and destroy the enemy. Exposed wire will not only give away the location of our message centers and command posts, but will enable the enemy to tap the wires with a resultant loss of secrecy.

g. Passwords, signs and countersigns should be used extensively and changed often in jungle combat. The words chosen should be those difficult for the enemy to pronounce and used only when other means of identification are impractical. Since the Japanese mispronounce certain groupings of English letters, words employing any two or all of these letters will certainly be mispronounced. The following short table indicates the manner in which the Japanese would pronounce certain groupings of English letters; note that they substitute "r" for "l", "su" or "za" for "th", and "b" for "v":

English Letters	Japanese Phonetic Pronunciation
La	Rah (soft "r")
Ly	Rye (soft "r")
Th	Su (soft "s" as "soft")
The	Za or Zeh
Very	Bedy ("y" like double "e" in "see")
Velvet	Berubet

h. Challenging at night should be done skillfully. The challenger must remain unseen in the shadows of a tree or building. He should challenge "Halt, who goes there?" and closely survey the party before allowing him to proceed. He should not permit the party to come within knife range. If

the party is recognized sufficiently he should be permitted to carry on. The password should not be used unless more positive identification is necessary, and then should be spoken only in a whisper.

JUNGLE WARFARE

APPENDIX I

STAFF DATA FOR JUNGLE WARFARE

	Number of men (1 squad)	Distance (yards)	Width (yards)	Area (square yards)	Hours	Tools
Trail breaking ..	12	3,000	$\frac{2}{3}$	2,000	3-6	Machetes.
Trail clearing ..	12	1,000	1	1,000	12	Machetes, axes.
Bridge building (animal).	12	6	3	18	4	Do.
Corduroying, cut- ting and placing.	12	100	3	300	12	Do.
Area clearing ..	12	1,000	1	1,000	12	Do.
Trail blocking ...	12	Time for felling trees			Do.e
Road building, dirt, passable for 1 vehicle.	12	50	3	150	12	Machetes, axes, shovels, picks.
Fire lane cutting	12	1,000	2	2,000	18	Machetes, axes.
Tree felling (cutting)	2	Can fell a single tree from 10 to 20 inches in diameter in 15 to 45 minutes.				Axes.

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